(*Pyrgiscus*) *dora* Bartsch but differs from that species in being banded, in having stronger and less numerous axial ribs on all the whorls, less appressment at the suture, a different pattern of spiral sculpture, and not as many spiral grooves on the base.

The species is named for Mr. John Q. Burch, of Redondo Beach, California.

A CRUDE NUMERICAL EXPRESSION FOR THE BRILLIANCE OF GASTROPOD SHELLS

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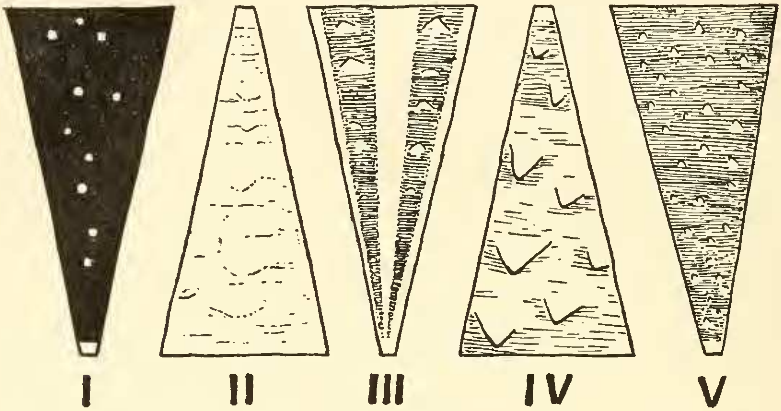
In Jamaica, B. W. I., the shells of *Neritina virginea* differ greatly in color, in pattern and in intensity of light reflected from their surfaces, not only in any one locality but in populations living in various fresh, brackish and salt waters. Thus in the Great Salt Pond, Ft. Clarence, very light shells were found by Metcalf in 1891, in water of density 1.0380, while in 1910 shells collected there were quite light, in water of density 1.0258–60–75 and decidedly darker in water of density 1.0174, in part of the same pond.

To express the intensity of reflected light thus found correlated with density, some numerical expression was sought for the terms "light" and "dark." In 1931 Professor A. H. Pfund had the kindness to supply this need by measuring for me the light reflected from one hundred shells from each of the above three densities as compared with the light from magnesium oxide, and he found that the darker shells from density 1.0174 reflected but 9 per cent while those from density 1.0258–60–75 reflected 18 per cent, and those from density 1.0380 reflected 37 per cent.

By 1936 some thirty-three collections of these shells from sixteen localities had been made, and the differences in brilliance noted. To express these differences numerically it was suggested by Professor Pfund that individual shells be compared with magnesium oxide by means of a photometer. I am indebted to Dr. L. B. Shettles for setting up the photometer that he had been using.

To make use of individual shells to represent a community it was necessary to select a proper one from the very diverse individuals of any locality.

While Metcalf had pointed out that the endless individual diversities might be grouped arbitrarily into classes that graded into one another, we found that one such grouping seemed of more value, as in any large collection from either salt or fresh water there are shells that fall into the five groups indicated in the diagram. In this diagram we represent the surface of the shell as



unrolled and projected so that the base of the triangle is the mature part of the shell and the apex the very young shell still without the color and pattern that it later assumes and, generally, holds constant through its life.

In group I we place shells that are melanic, either pure black or with small scattered light spots on dark background. In II shells that are albinic with pale ground and very little pattern. In III shells that exhibit at least one equatorial band of light, free from pattern, or rarely an obscure band of red, or sometimes banded arrangement of small spots. In IV are the common shells that are blotched with very diverse patterns of angular areas of dark on light ground. In V, minute spots or dots represent the light areas outlined by the angular pattern of IV.

Census of populations showed that in saline waters shells in group IV were much more numerous than in the other groups, while in fresh waters shells in group V are the most numerous.

For example in the above intermediate locality in which one hundred shells gave reflected light 18 per cent of that from the oxide, the entire population of 28212 shells fell into the above groups as follows: in I 5%, in II 4%, in III 19%, in IV 63% and in V 8%.

The light coming from these shells is made up of the light ground, whitish or yellow with occasional red or bluish; of the pattern that is resolvable into fine meridional lines of dark; and in addition the high lights made by reflection from the generally highly polished surface. To give value to these high lights the shells were put below the focus of the microscope and thus a blurred composite light compared with the light from the movable bulb of the photometer.

We found that in the above collection of 28212, shells of I gave 6–12%, of II 20–40%, of III 16–40%, of IV 20–40%, of V 20–33%. On the other hand the large, dark shells in the cascades of the Great River compared with the oxide showed: in I 4%, in II 20%, in III 20%, in IV 13%, and in V 20%.

In the thirty-three collections from sixteen localities the light reflected by an average shell of group IV or of V was taken to represent the entire community, though obviously there were many shells that were darker and many lighter, but they were minorities. The selected representatives from salt environments gave values of 19–48 per cent and those from fresh waters 12–22 per cent. Thus, as emphasized by Metcalf, *Neritina virginea* in Jamaica shows marked correlation between salinity and brilliance of shell.

It is also very conspicuous that saline forms are small as compared with fresh. However, salinity is not the only factor in which fresh and salt environments differ. Doubtless the food available may differ and, though unfortunately not measured, the light that falls upon the snails seems to differ since the small brilliant shells are found in clear sea water that is not shaded and seldom turbid and at depths of but a few inches, or less, that the sunlight penetrates with heat, light and short rays; while the larger darker fresh water forms live deeper, were often shaded, and in water frequently turbid, and thus they are exposed less to all the rays of the sunlight.

It may be that toward the solution of the problem of the effects of environment upon these snails some attention should be given to the amount and character of the light that falls upon them during most of their life, as this may well be significantly correlated with the brilliance of the shell itself. Unfortunately the light received and that reflected have not been measured in light units, but the present method of comparing the brilliance with a standard may have some reconnaissance value.

It can be applied to other gastropods. Thus at Sandy Bay *Nerita tristis* gave values of 21% which compares with the average of *Neritina virginea* there of 28%, and these two crawling together have some resemblances in patterns that may lead to mistaking one for the other.

A NEW SPECIES OF STENOTREMA FROM EAST TENNESSEE

BY ALLAN F. ARCHER

STENOTREMA WALDENSE, new species. Text figure 1.

Description.—Shell small, imperforate, rather solid, subglobose, dull. Color varying from very light chestnut-brown on body-whorl to dull ivory on earlier whorls. Cuticle horny brown. Peristome and parietal lamella very pale ivory. Whorls 5, rather gently increasing, moderately convex, nuclear whorl somewhat convex. Suture gently impressed. Body whorl slightly bulging behind peristome, and having a faintly angular periphery. Base of body-whorl rather convex. Aperture narrow and transverse. Outer peristome flaring outwards, rather narrow, becoming in-

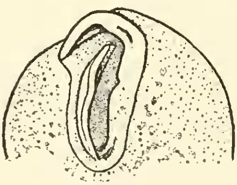


FIG. 1.

creasingly narrow where it joins the body wall. Basal peristome rather narrow. Anal sinus gently rounded. Subanal denticle weakly angular. Interdenticular sinus quite broadly curved and having a flat surface. Outer and basal denticle on either side of the notch undifferentiated from inner rim of peristome. Notch v-shaped, very reduced and narrow. Parietal lamella simple, very gently arched and not prominent; proportionately short, its distal end not descending deeply into the aperture in the vicinity of the